



# Architecture Portfolio

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2025

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Photo taken by myself during a field trip in  
Morgan Motor Company (2024)



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# Steam Grove

Ash Wood: From  
Disease to Design

2025

## Project Key Words:

Steam Bending Techniques, Sapwood Utilization, Ecological Resilience, From Waste to Design.

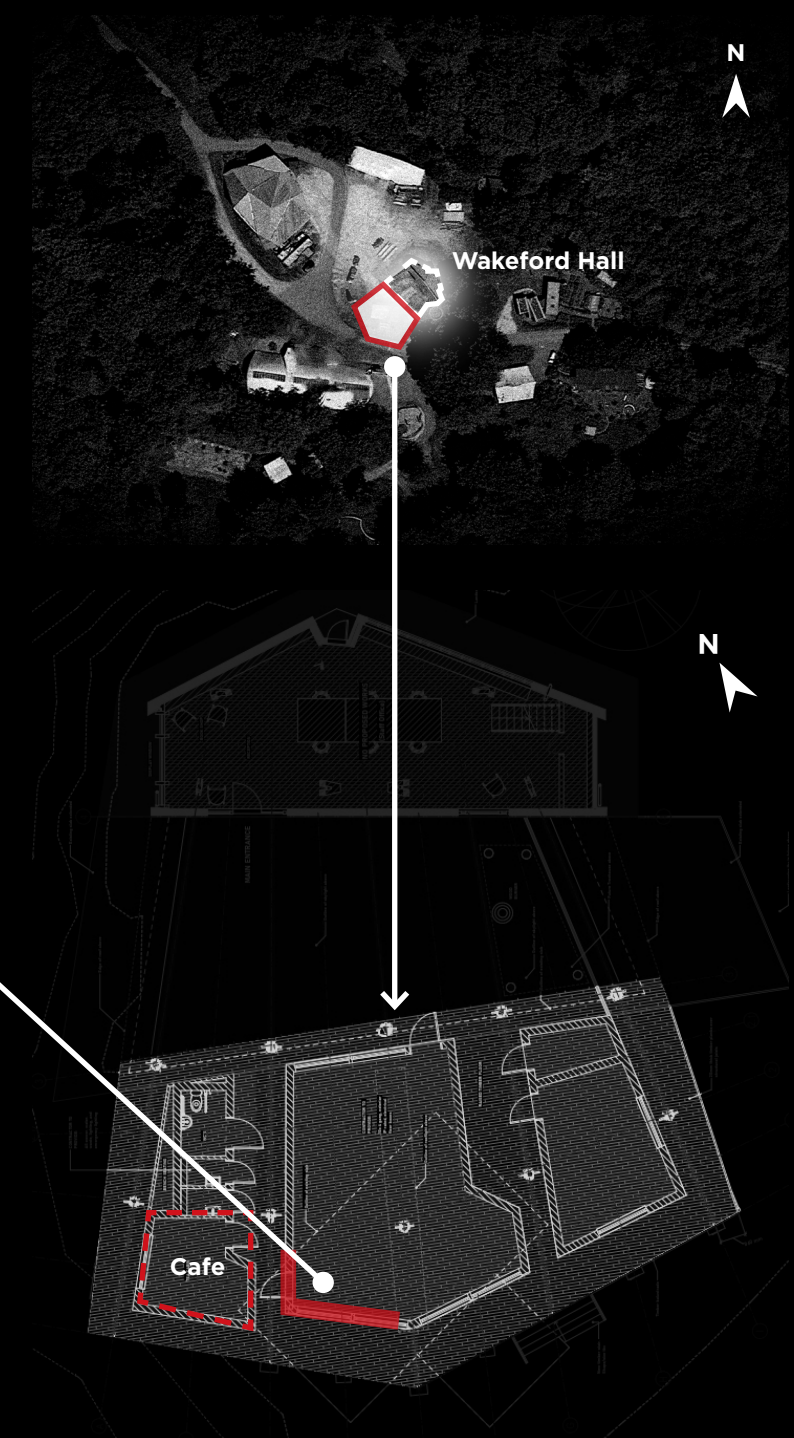
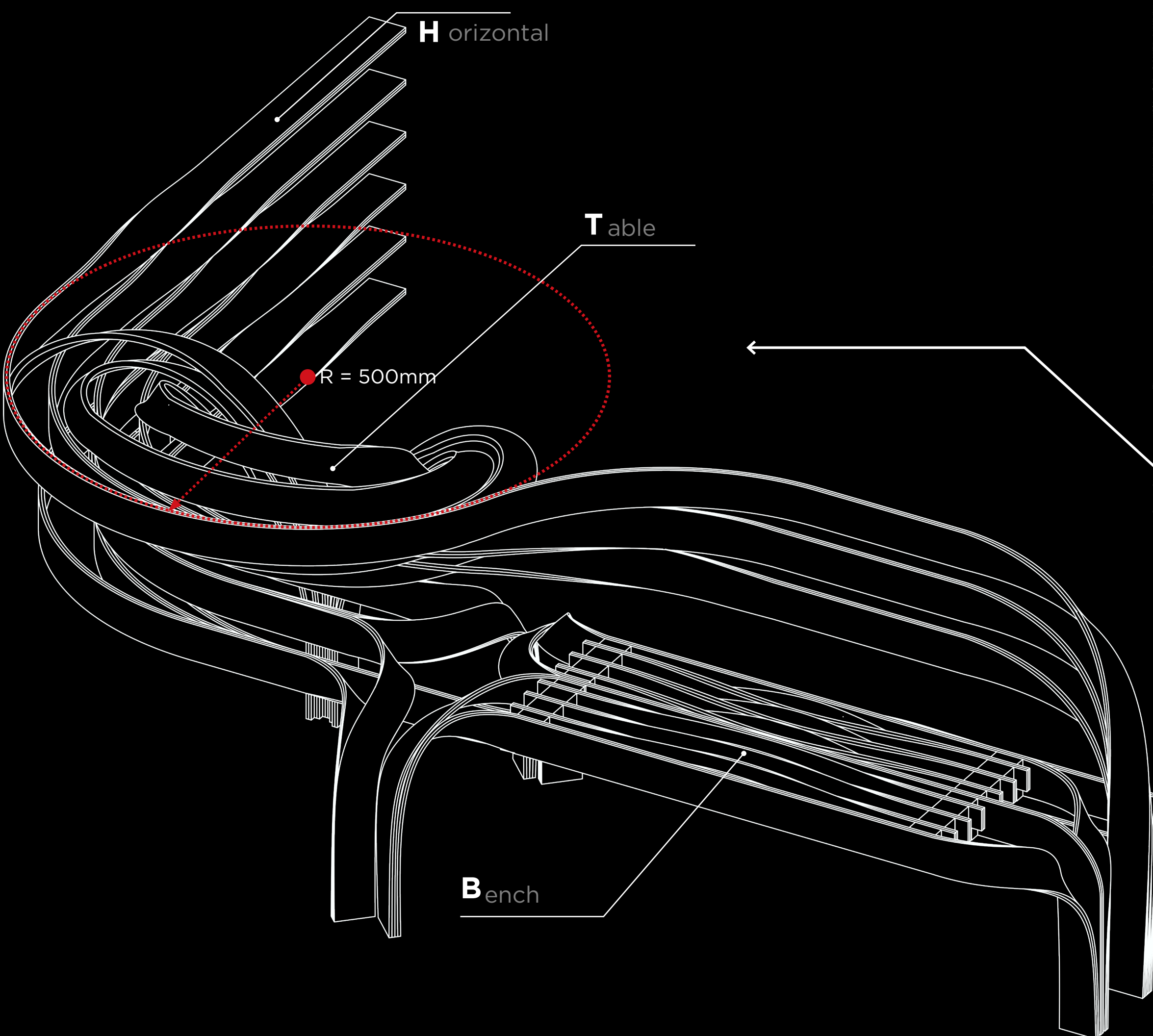
## Project Description:

This project explores how ash wood, threatened by the Ash Dieback disease, can be reimagined rather than discarded. By extracting healthy sapwood from infected trunks and enhancing its flexibility through steam bending, the research demonstrates how compromised resources can be recovered and given new life.

The method is tested at the café bar entrance of the new Wakeford Hall in Hooke Park, where steam-bent ash elements reframe a corner façade and integrate a small table and bench. This transforms the threshold from a transitional edge into a place for pause and encounter.

Beyond this intervention, the project raises broader questions: How might architecture confront ecological crises by engaging directly with damaged materials? Can decay and disease become drivers of innovation, and how might “compromised” resources inspire new spatial and social possibilities?

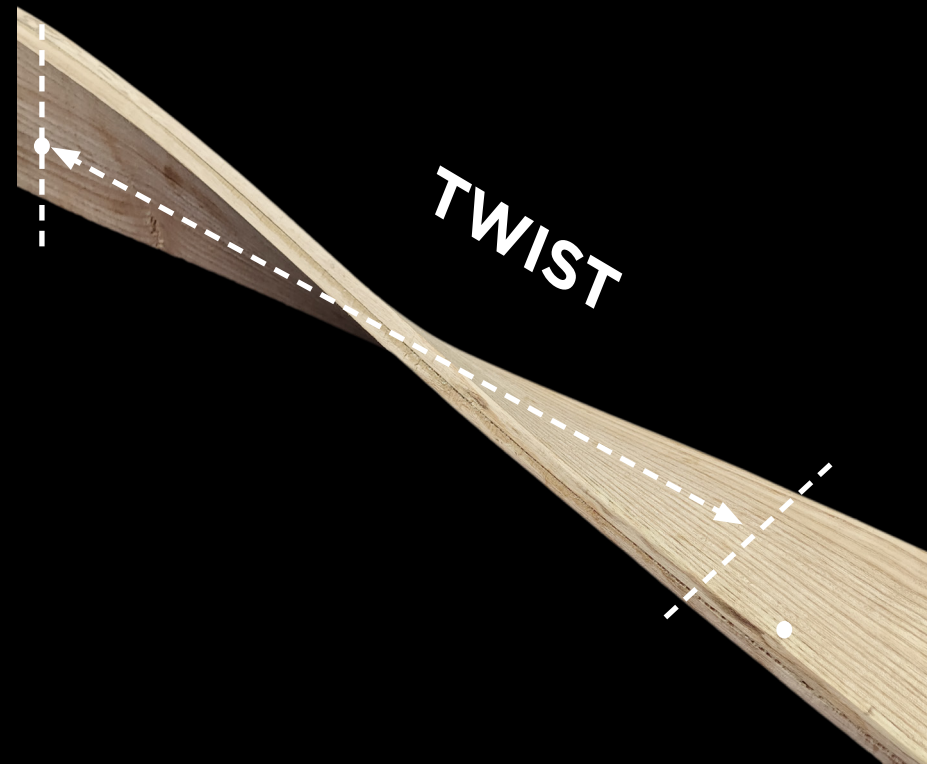
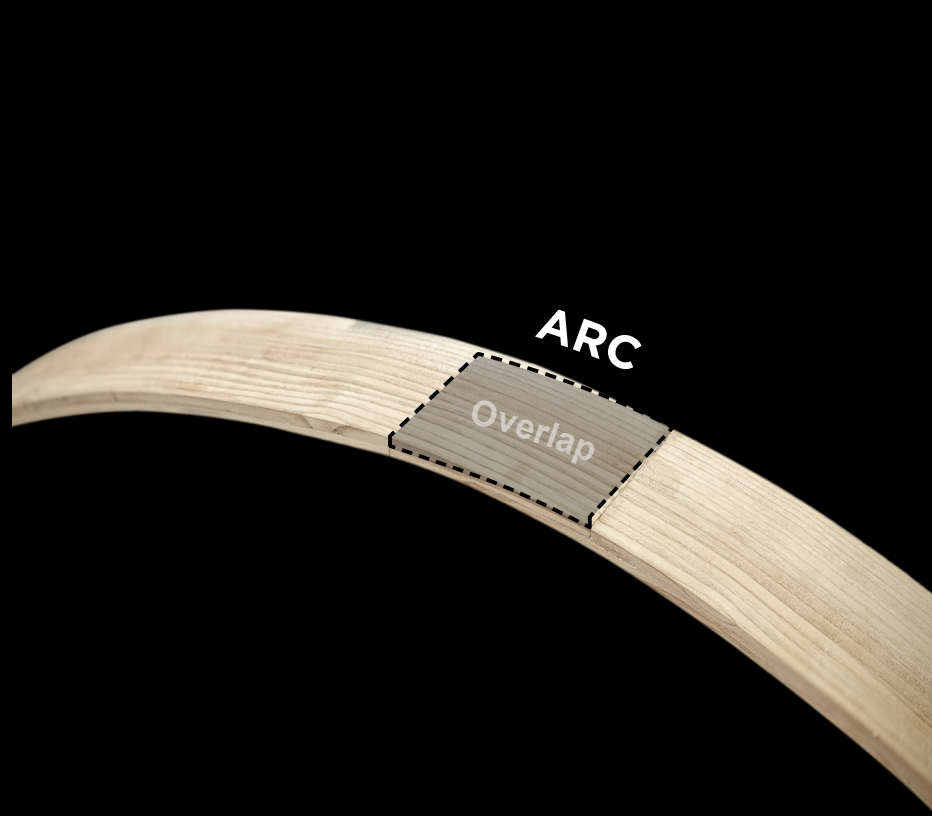




**V**ertical

The café bar corner was chosen as a site of intervention because it represents both a threshold and a moment of pause. By reconfiguring this overlooked junction with steam-bent ash components, the design transforms a transitional edge into a usable space — integrating a small table and bench that invite people to stop, rest, and encounter one another.



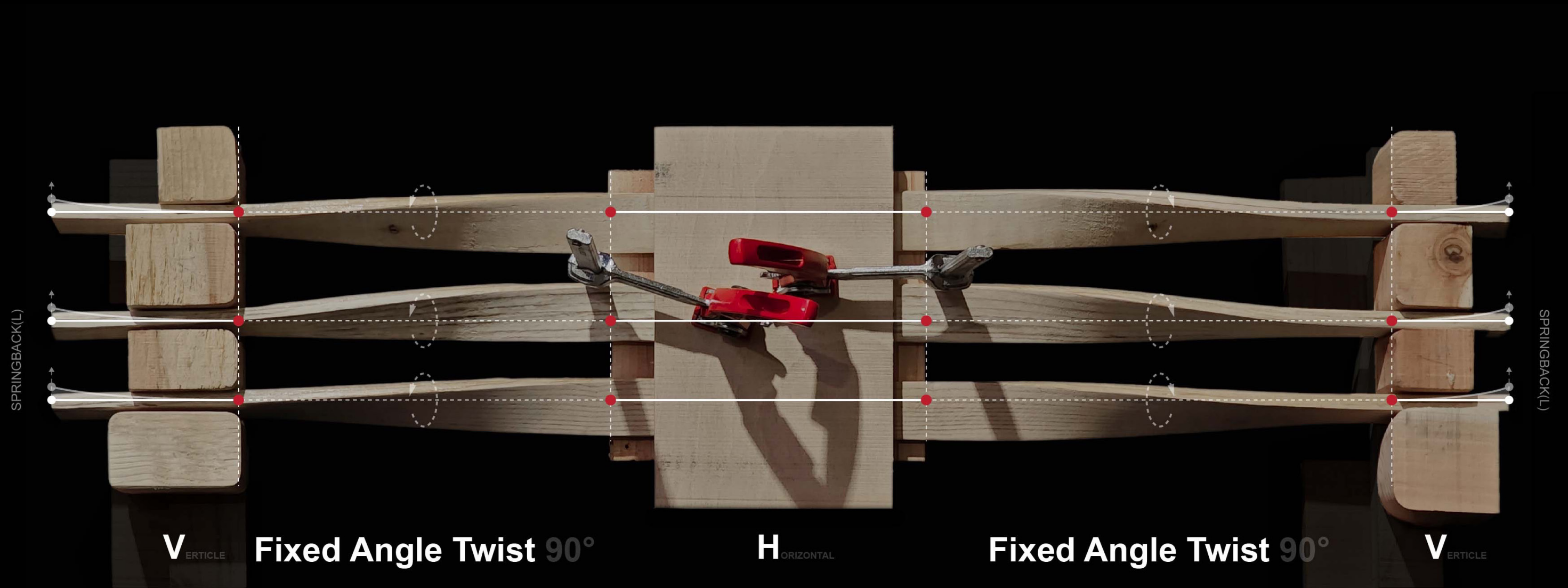


In response to time constraints and to simplify the assembly process, the project classified its components into three fundamental types. The first type was produced through bending only, focusing on achieving controlled curvature via steam

treatment. The second relied solely on twisting, emphasizing the exploration of material resilience and expressive potential through torsion. The third combined both techniques—twisting accompanied by bending—resulting in more complex

geometries that push the limits of material flexibility. Furthermore, all components were joined by adhesive connections at offset overlapping sections located at both ends, ensuring continuity and structural integrity across the system.





Prototype Scale - 1:1 | Lamella Section W x T (mm) - 70 x 5 | Mode - Fixed-angle Twist | Heating Route - Steam Bag | Forming Length(mm) - 950  
 Time on Jig (h) - Before Gluing 24 After Gluing 48 | Target - Fixed-Angle Twist - 90° Twist Segment Length(mm) - 225 | Overlap Length (mm) - 0  
 Springback (L/M/H) - L | Success Rate (No Cracking During Forming) n/N(%) - 12 / 15 (80.0%) | Re-Clamp Y(h)/N - N

To ensure that the bench offered a relatively flat and stable seating surface—despite the natural spring-back that occurs during steam bending—we adopted a consistent fabrication strategy. All seating elements were produced using the same jig, with material selected from equivalent portions of the ash logs. These pieces were then steam-treated and cooled simultaneously, allowing

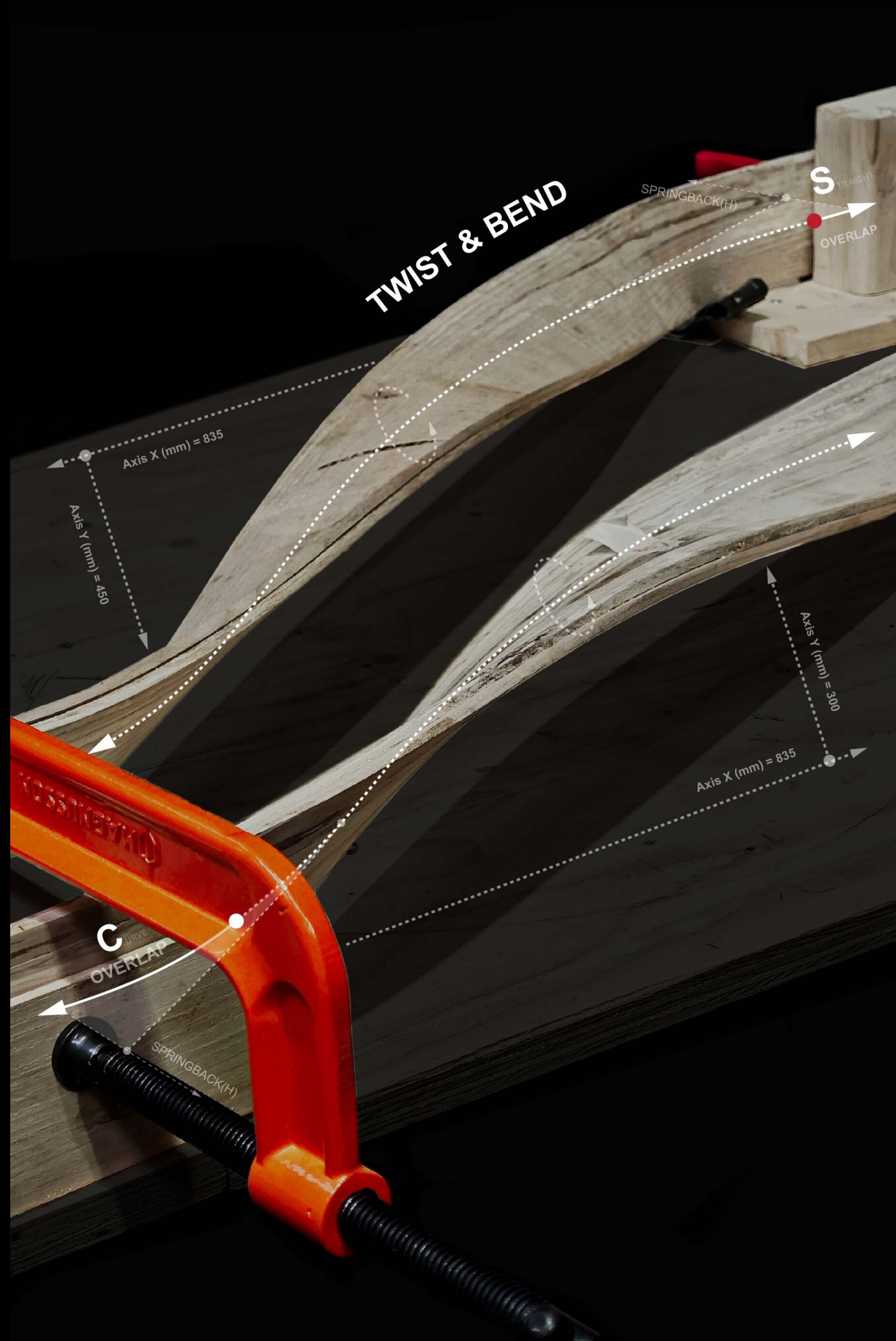
them to follow similar deformation patterns. This method not only minimized irregularities but also created a coherent surface that provides both visual continuity and a uniform tactile experience, making the bench more comfortable and inviting for moments of rest and leisure.



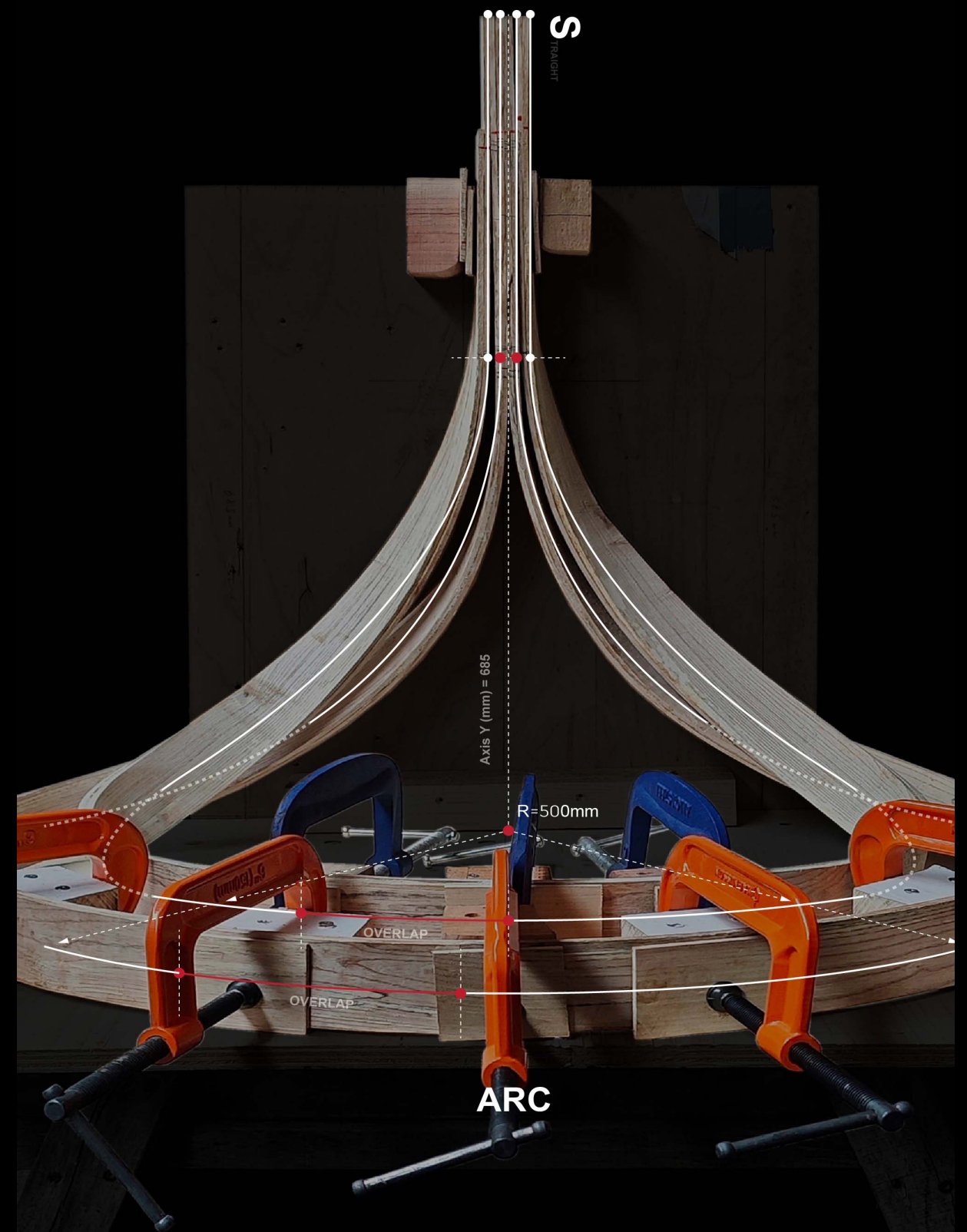


Prototype Scale - 1:1 | Lamella Section W x T (mm) - 70 x 5 | Mode - Fixed-angle Twist | Heating Route - Steam Bag | Forming Length(mm) - 680 / 830 / 980 / 1130  
Time on Jig (h) - Before Gluing 24 After Gluing 48 | Target - Fixed-Angle Twist - 90° Twist Segment Length(mm) - 480 | Overlap Length (mm) - 100  
Springback (L/M/H) - L | Success Rate (No Cracking During Forming) n/N(%) - 20 / 24 (83.3%) | Re-Clamp Y(h)/N - N





Prototype Scale - 1:1 | Lamella Section W x T (mm) - 70 x 5 | Mode - Twist & Bend  
 Heating Route - Steam Bag | Forming Length(mm) - 1025 / 1115 / 1180 / 1195  
 Time on Jig (h) - Before Gluing 24 | After Gluing 48 | Target - Fixed-Angle Twist - 180°  
 Twist Segment Length(mm) - 825 / 915 / 980 / 995 | Overlap Length(mm) - 100  
 Springback (L/M/H) - H | Re-Clamp Y(h)/N - Y(24)  
 Success Rate (No Cracking During Forming) n/N(%) - 16 / 21 (76.1%)



Prototype Scale - 1:1 | Lamella Section W x T (mm) - 70 x 5 | Mode - Twist & Bend  
 Heating Route - Steam Bag | Forming Length(mm) - 1340 / 1650  
 Time on Jig (h) - Before Gluing 24 | After Gluing 48 | Target - Fixed-Angle Twist - 180°  
 Twist Segment Length(mm) - 740 / 770 | Overlap Length(mm) - 200  
 Springback (L/M/H) - L | Re-Clamp Y(h)/N - Y(24)  
 Success Rate (No Cracking During Forming) n/N(%) - 8 / 12 (66.6%)











# Datum

Tree branches:  
From discard to utilization

**Project Key Words:**

Natural Timber Structures, Tension-Based Assembly, Low-Tech Fabrication, Waste-to-Structure, Adaptive Structural Systems

**Project Description:**

Building on The Datum project, this new group project aims to create a suspended roof structure that serves as an entrance feature for Datum. Using the natural alignment of trees on both sides of the site as anchor points, the new design reinterprets Datum by rotating its original plane to form a lightweight, hyperbolic-like surface made from straight beams. Unlike the original walkway, this structure removes the walking surface and introduces a new roof covering material. To accommodate the roof's specific geometry, a new jig was developed to cut branch forks precisely according to top angles, and the tension system was redesigned to suit the new suspended configuration.

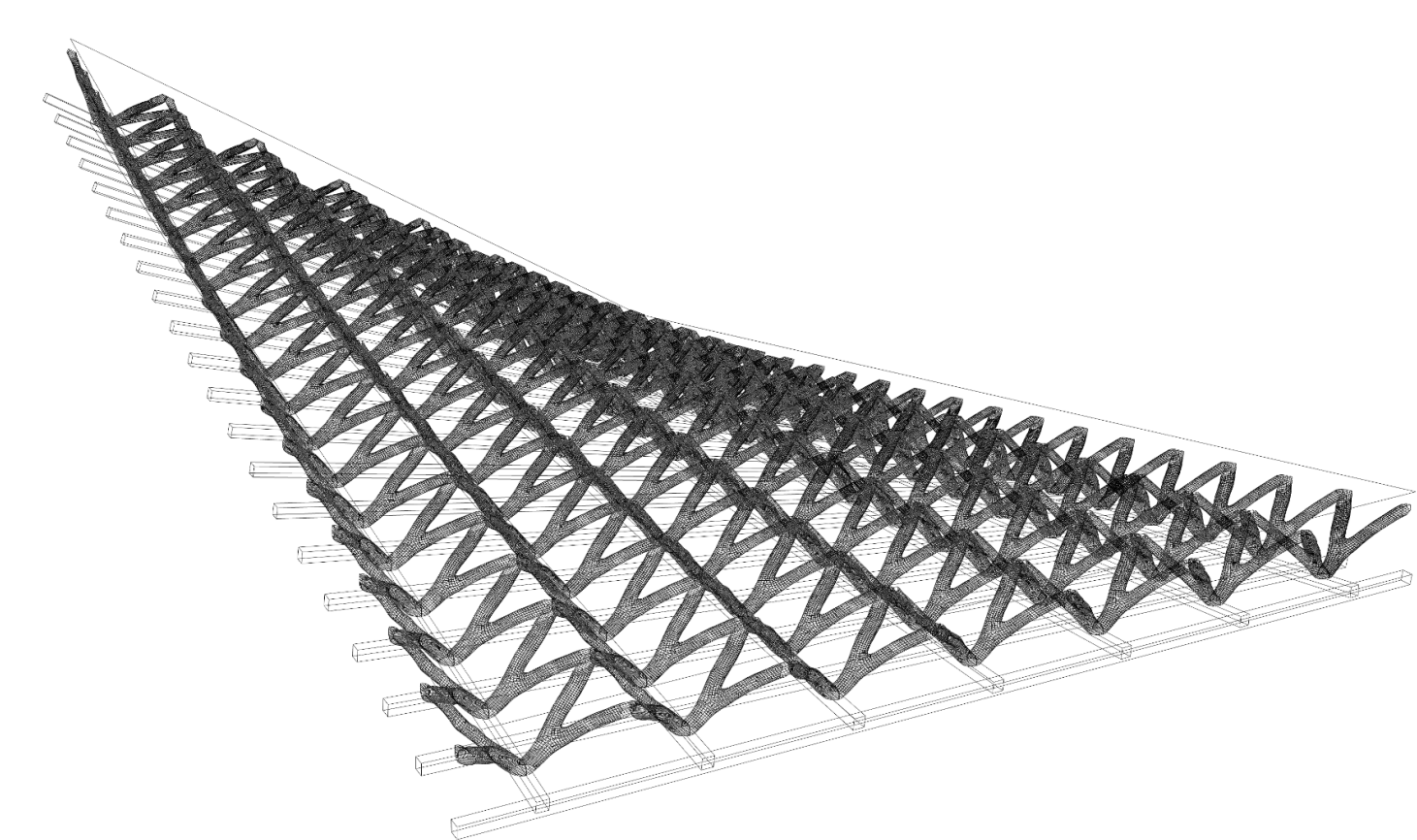
As background, The Datum explored small-diameter forking branches as structural elements, creating a 15-meter space truss walkway without mechanical fixings, using only tensioned ropes and bespoke joints. By transforming discarded branches into valuable construction components, Datum showcased how natural geometries and accessible tools can unlock new material potentials. This new phase extends that research into overhead structures, further demonstrating the adaptability and architectural value of irregular timber.



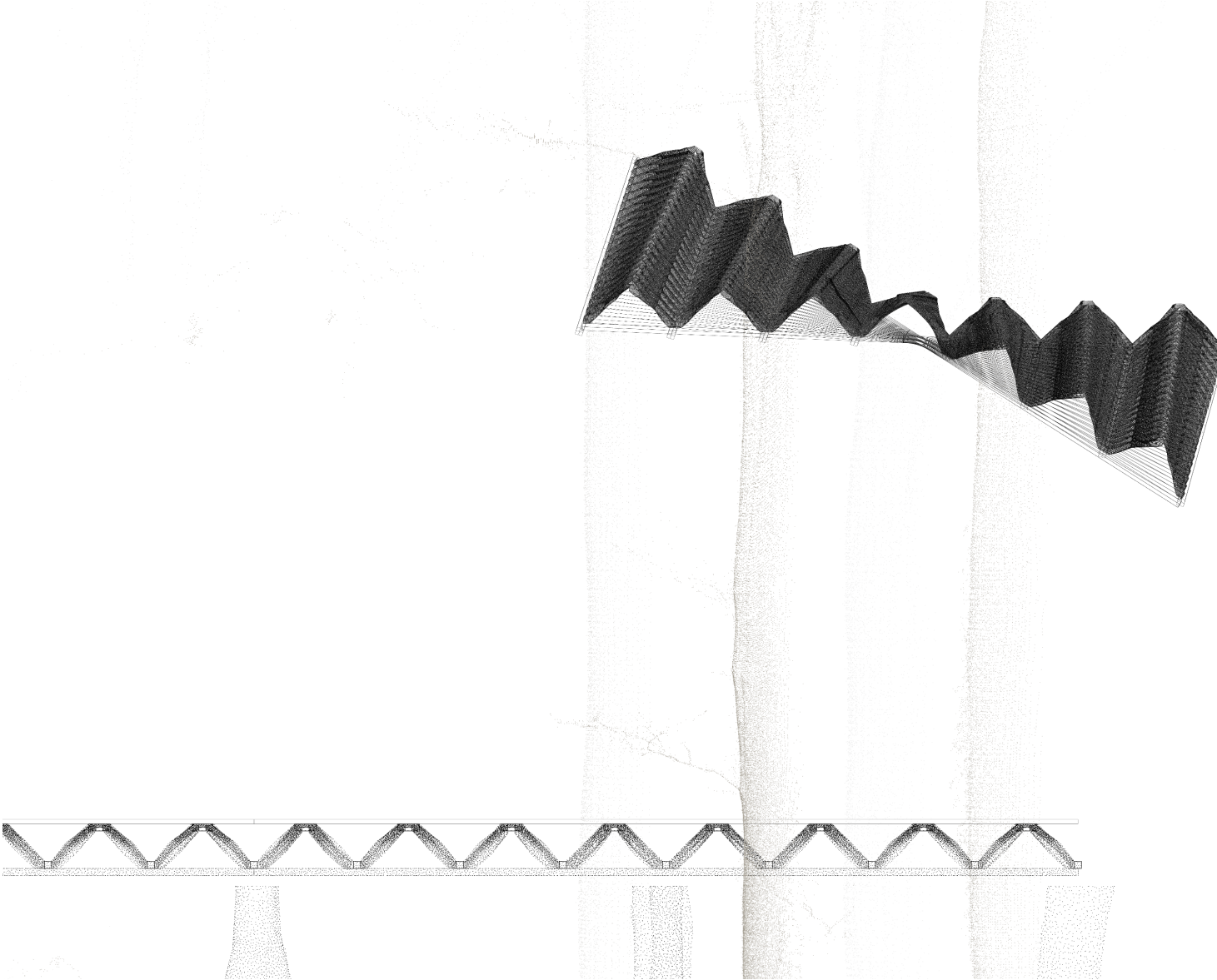




Photo provided by Lakshay in Hooke Park Project: DATUM (Ramtin, 2024)



3D Model



Radar scanning point cloud & design concept





Base of Hand-Model



The new context of this tensioning system is a roof structure. Since there aren't any upper boards or beams, the eye bolts between the two forks need to change their positions to where 4 Forks intersect, allowing the top rope to pass through and pull the forks downwards and together.

The intersecting Point is created in the 4 Forks by routing quarters of a circle in each fork. Put together they create a cylindric void for the eye bolt to pass through. The eye bolt is being restricted by a washer and nut which rest on the top surface of the 4 Forks.

The goal is to create stable Points on top of the forks for a membrane or shingles to be anchored to.



Cylindric void for the eye bolt



Stable Points on top of the fork





Top view of Hand-Model



Top view of Hand-Model Tension



Side view of Hand-Model Tension

In contrast to the tensioning system in the existing datum, we chose to use two ropes in the long direction of the prototype which meet the short top rope below the intersection of 4 forks.

At this meeting point, the two long ropes and the short, top rope form three triangles spreading the tension across the forks and the frame.





# Game Cube

Fusion of Game Engine  
& Game Studios

## Project Key Words:

Immersive Experience, Game-Inspired Architecture, LED Media Façade, Esports and Innovation, Symbiotic Design

## Project Description:

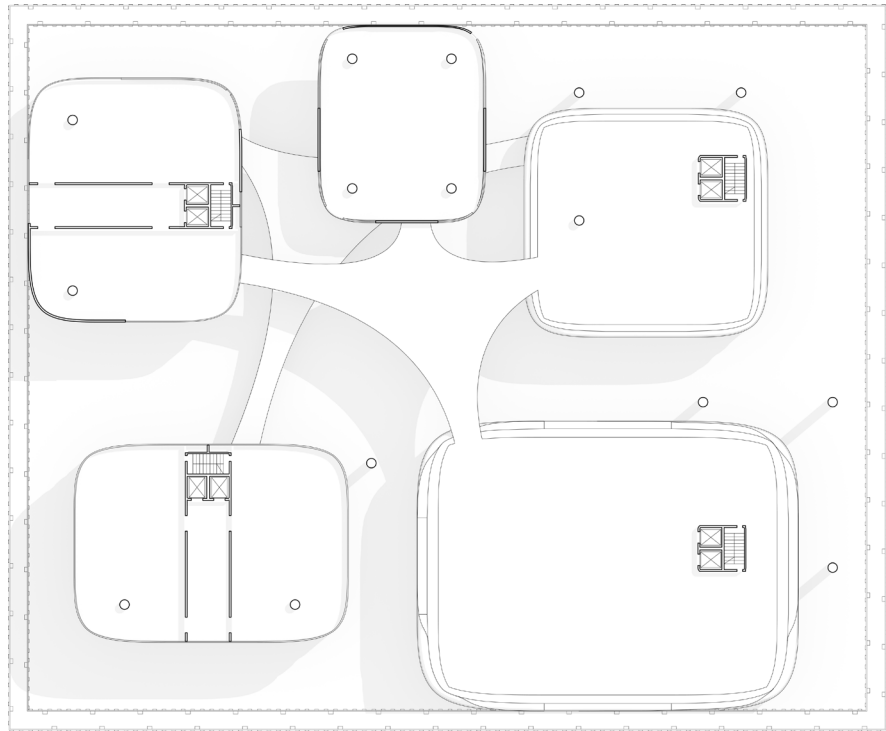
This building, inspired by Las Vegas's Sphere, integrates visiting, office, and a large LED screen. The colossal screen showcasing game-related content is unmissable throughout the interior, providing an immersive experience. Visitors can admire the screen's content from the rooftop with an unobstructed view, while game developers witness visitors' appreciation firsthand. The tallest floor houses a subsidiary of a game engine company, acknowledging the symbiotic relationship between game development and engine innovation. This space aims to accelerate mutual growth and development between the gaming and game engine industries.

In today's world, gaming has evolved into esports, akin to traditional sports, pushing human limits and fostering self-discovery. However, in our country, gaming is still associated with idleness, and parents often discourage children from spending time in the perceived meaningless gaming world. Through this building, I aim to dispel parental concerns and misconceptions, highlighting the positive aspects of gaming and esports as avenues for personal growth and exploration.

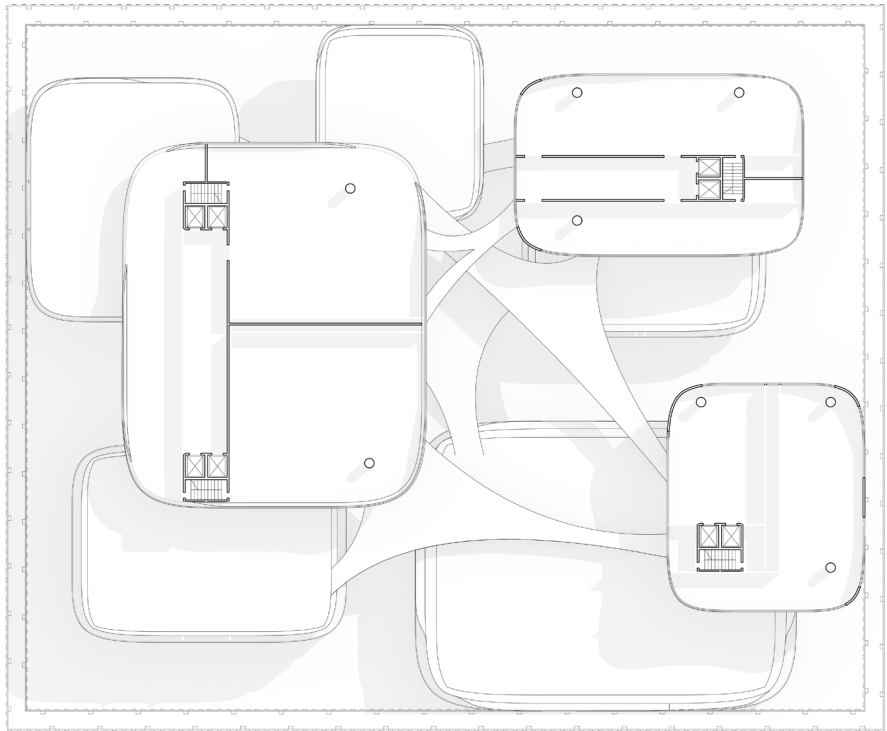




Street view rendering



1st Floor Plan



4th Floor Plan



Viewing platform on the 3rd floor of the interior (West) rendering



Viewing platform on the 3rd floor of the interior (East) rendering

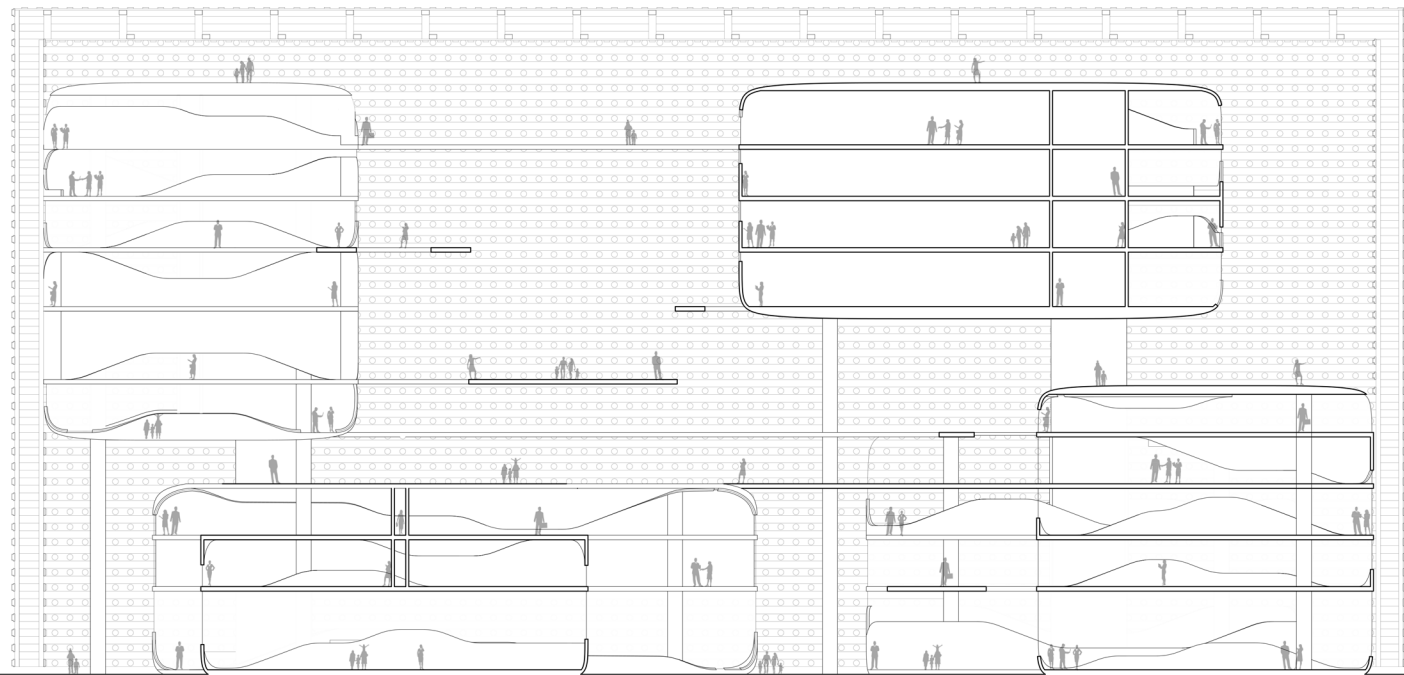


Looking up at the covered bridge rendering

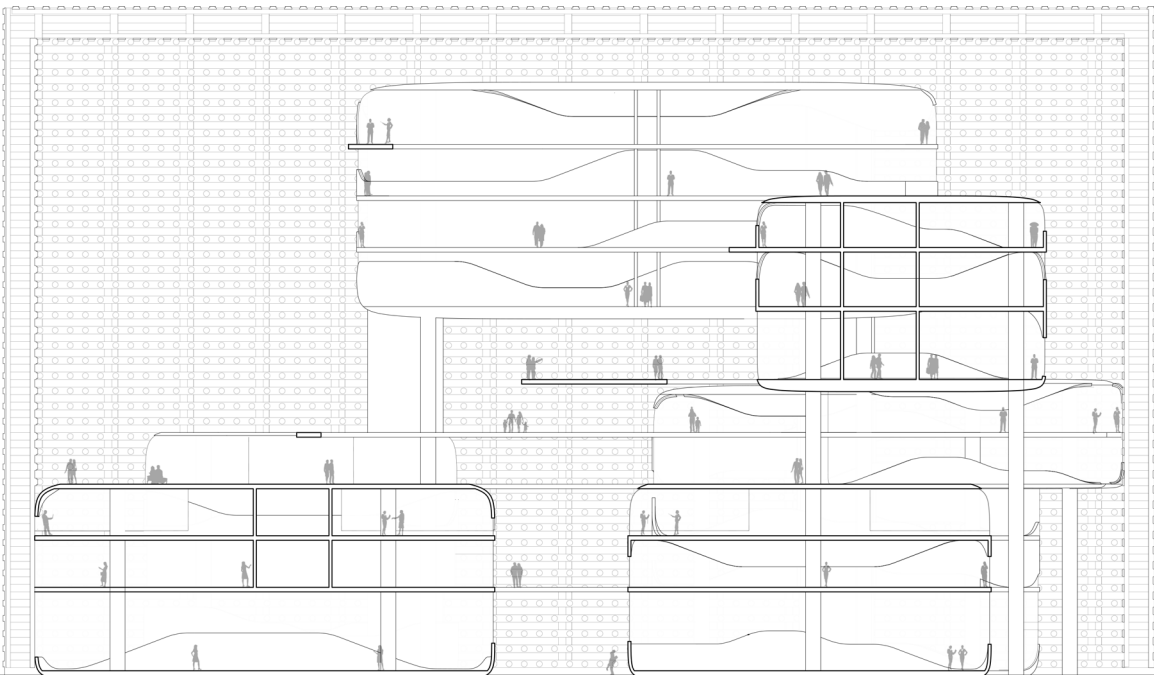


Looking down at the covered bridge rendering

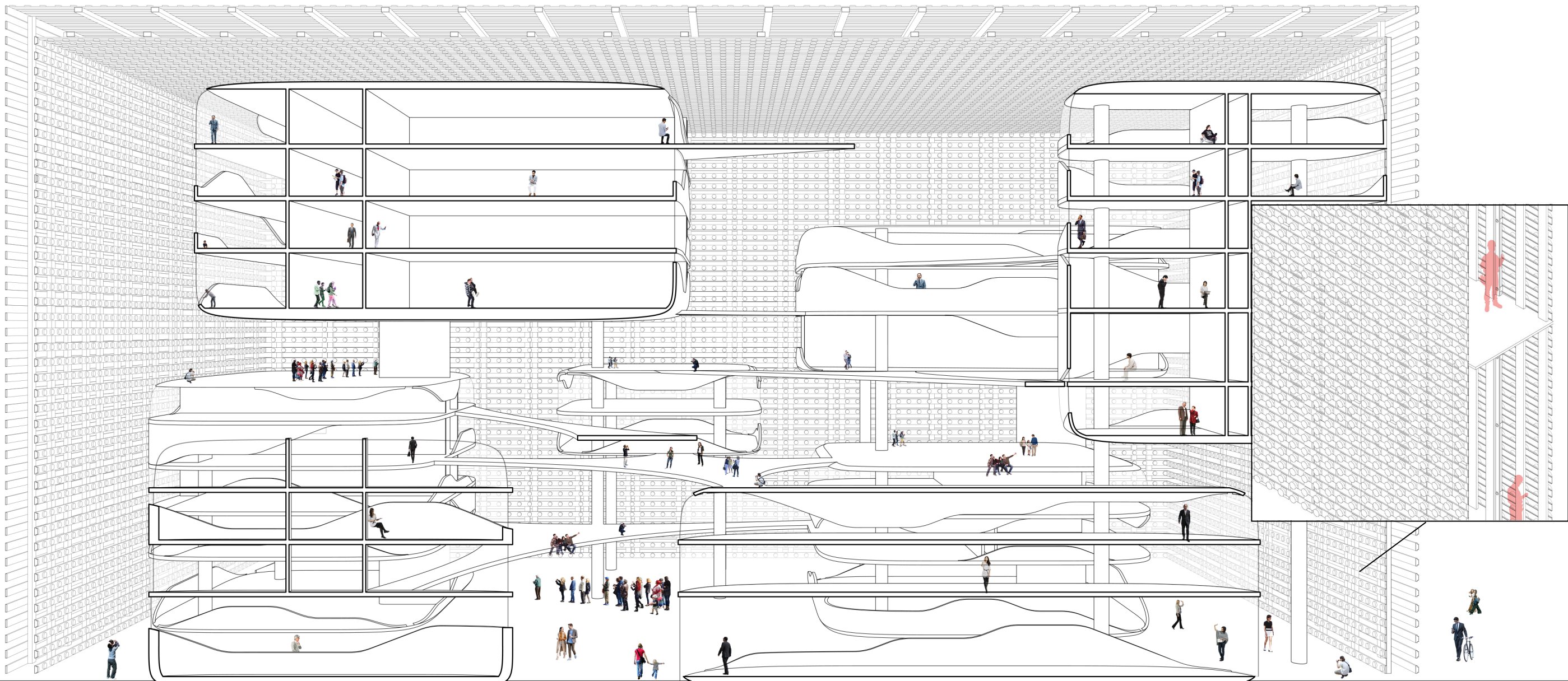




Sectional Plan



Sectional Plan



Sectional Perspective



# EqualStride Empowerment

Disability Sports Center  
& Prosthetic Customization

**Project Key Words:**

Accessible Architecture, Biomechanical Structure, Inclusive Sports Space, Prosthetic Innovation, Social Integration Hub.

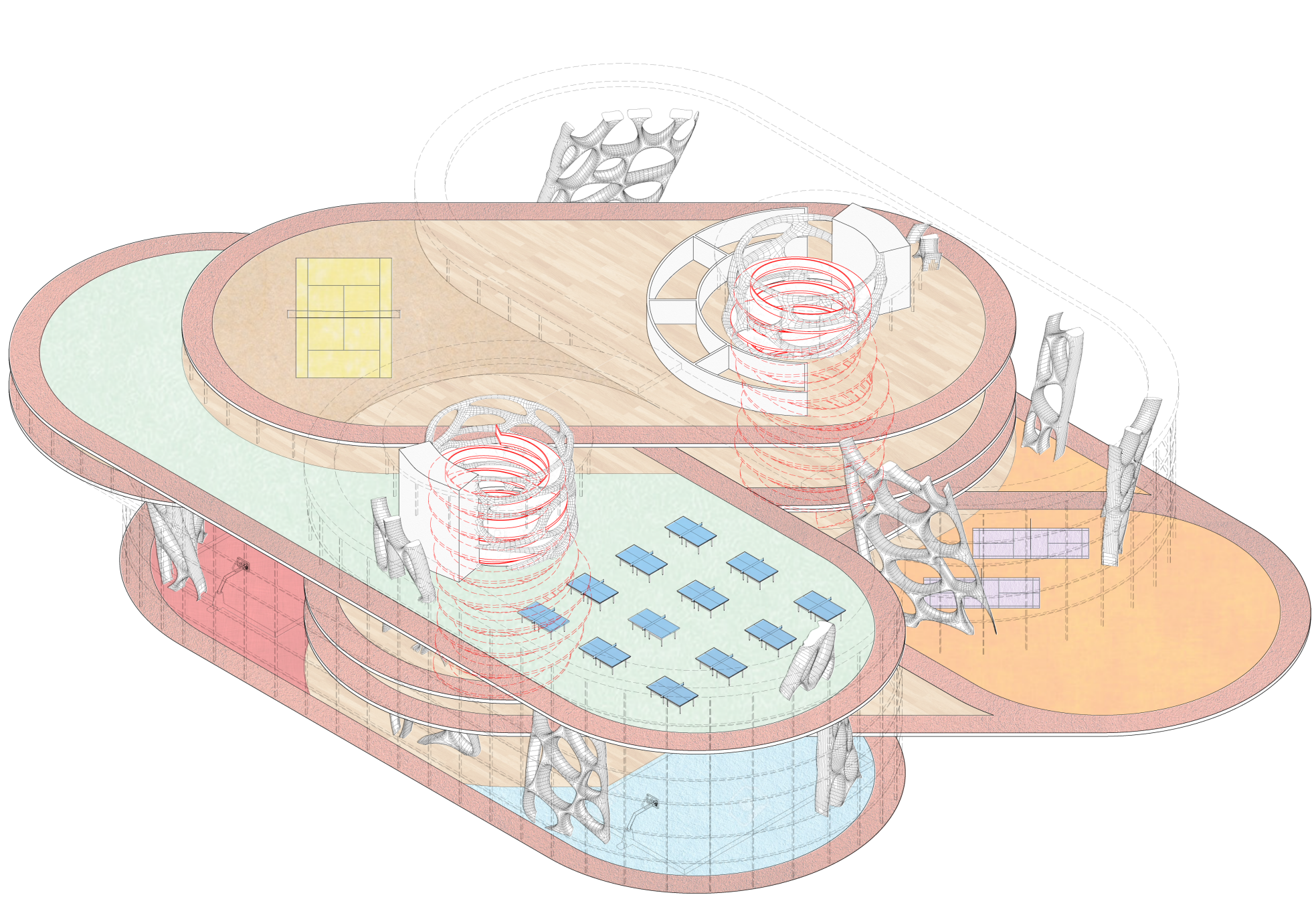
**Project Description:**

This is a building designed with varying floor heights determining spatial functions (prosthetic customization and sports spaces). Two ramps on each side form the cores, allowing easy circulation for individuals with mobility challenges. The structure comprises planes at multiple angles between the cores, with lower levels (approximately 4m) designated for offices and higher levels for sports. The support structure mimics human bone tissue, providing stability akin to bones in the human body.

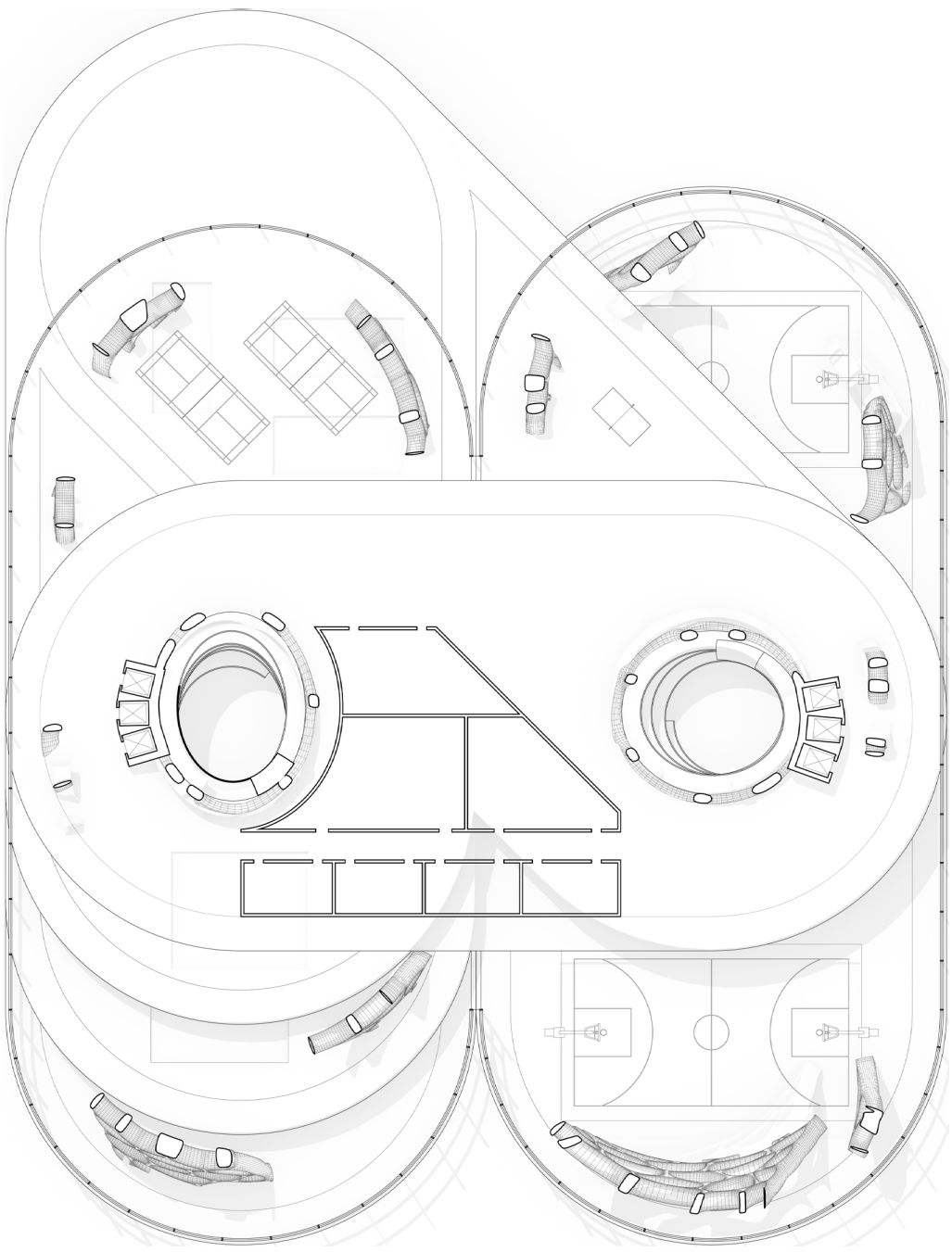
In our country, the development of facilities for disabled individuals is incomplete and difficult to implement. Many rely on narrow public spaces in congested areas, which are increasingly dominated by automobiles, hindering their access to sports facilities. This building accommodates various sports spaces for the disabled and includes a prosthetic customization company, facilitating prosthetic understanding and tailored design based on observation data. It serves as a gathering place for disabled individuals to find community and fosters a reduction in discrimination and excessive attention from others.



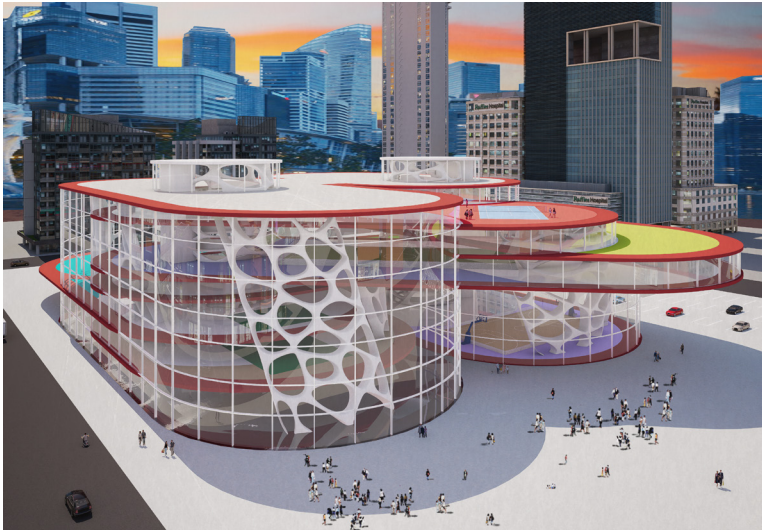




Building functional area analysis drawing



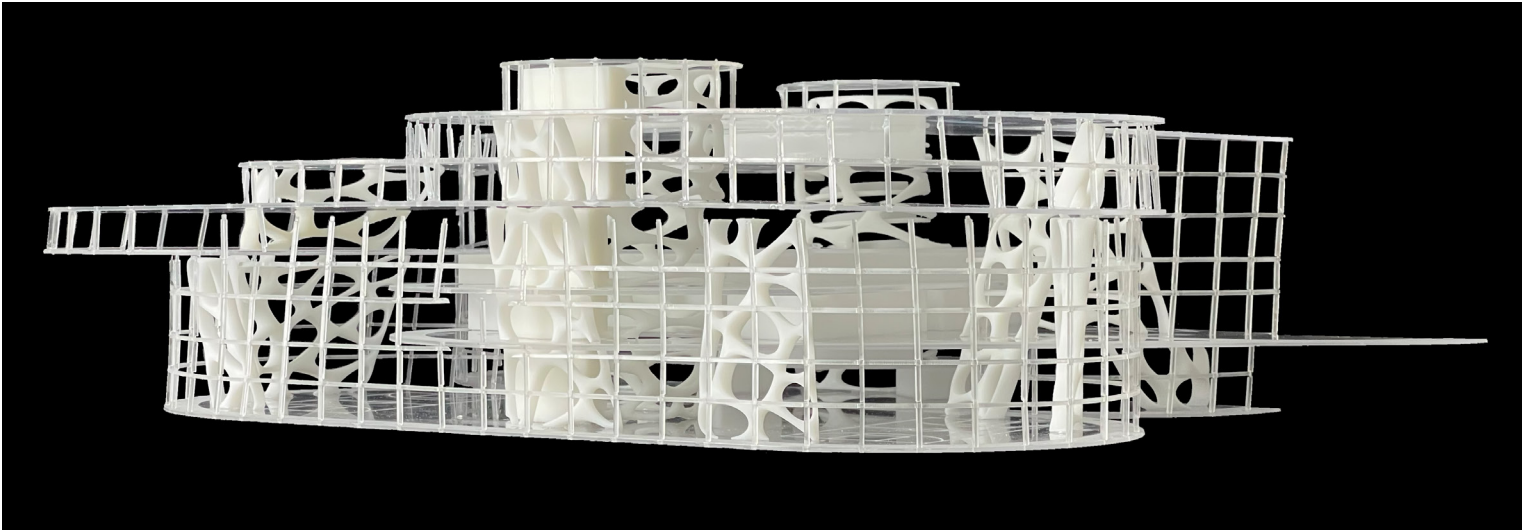
7th Floor Plan



Aerial view rendering

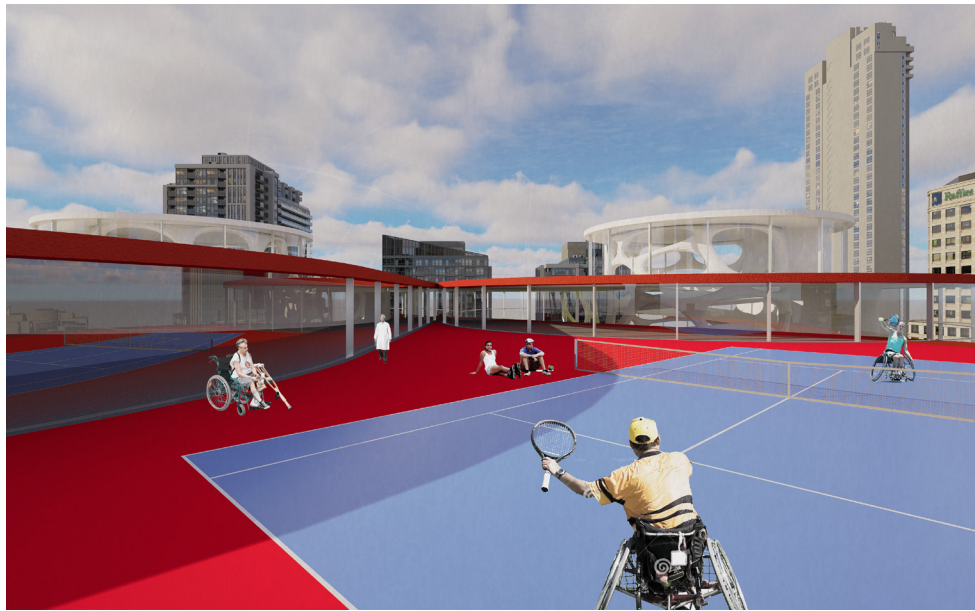


Core tube traffic ramp

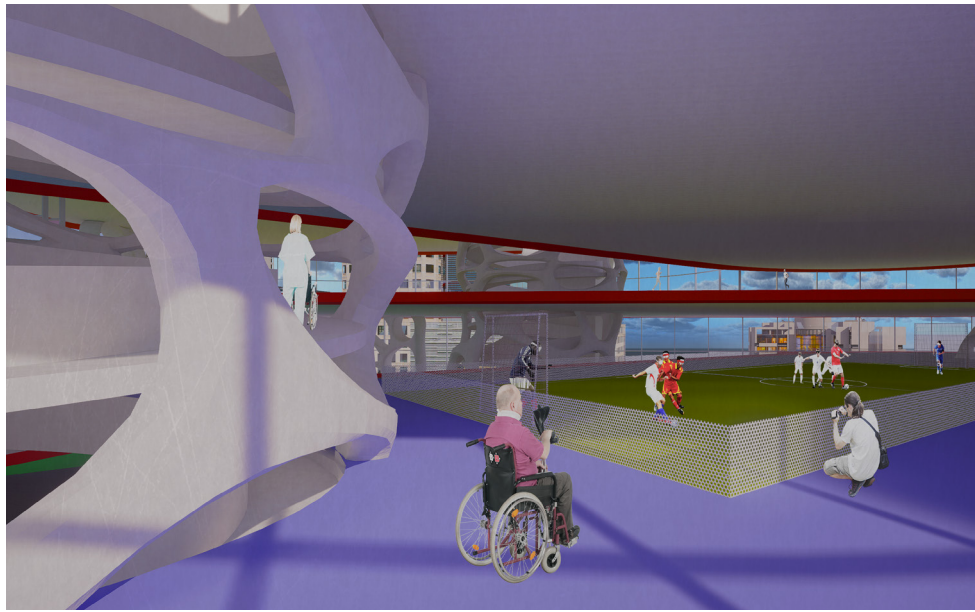
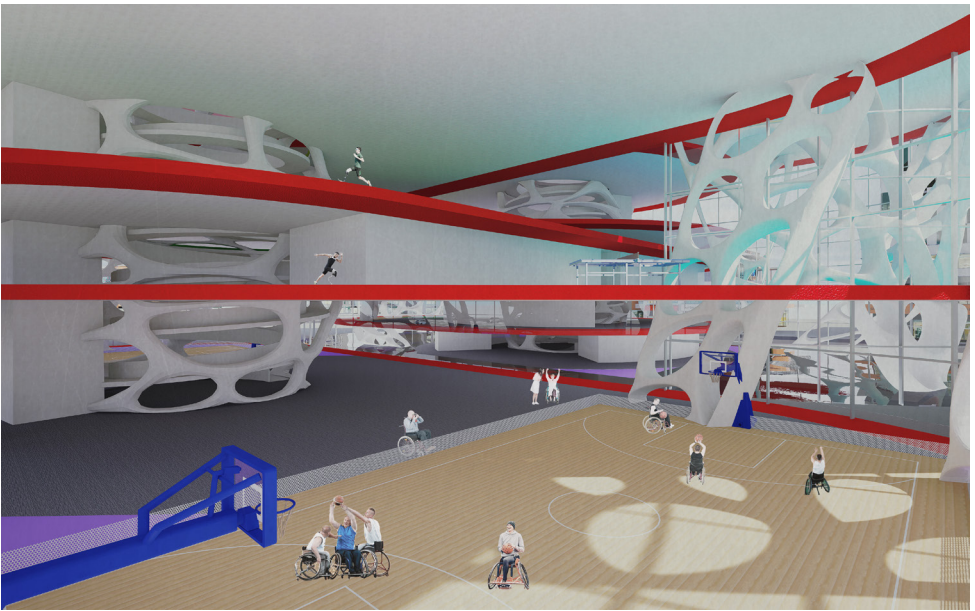


Project Hand-Model

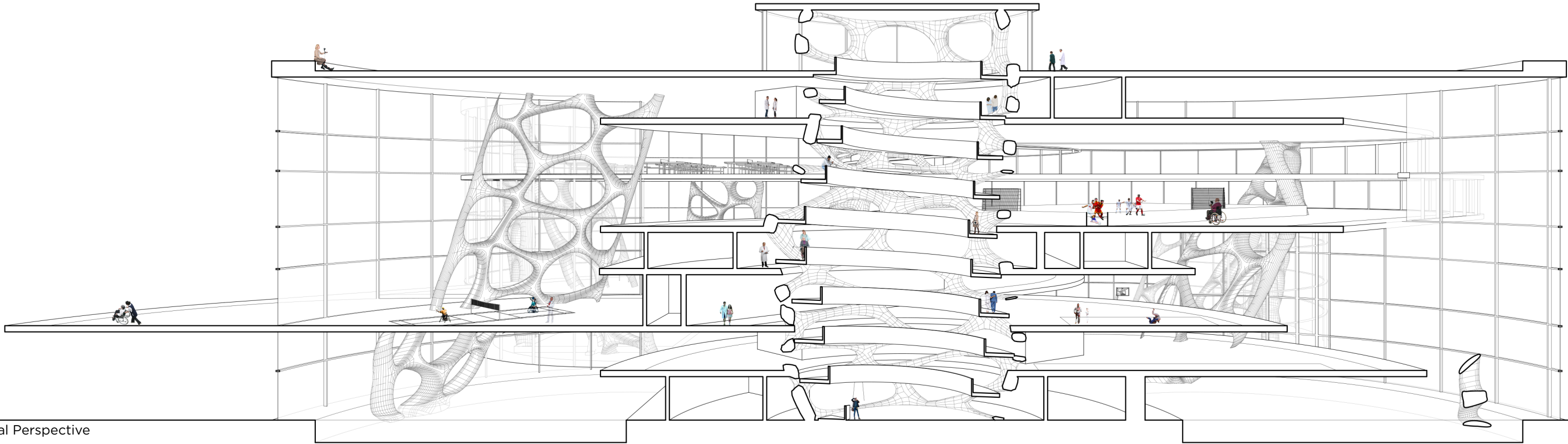




Rooftop outdoor rehabilitation area rendering

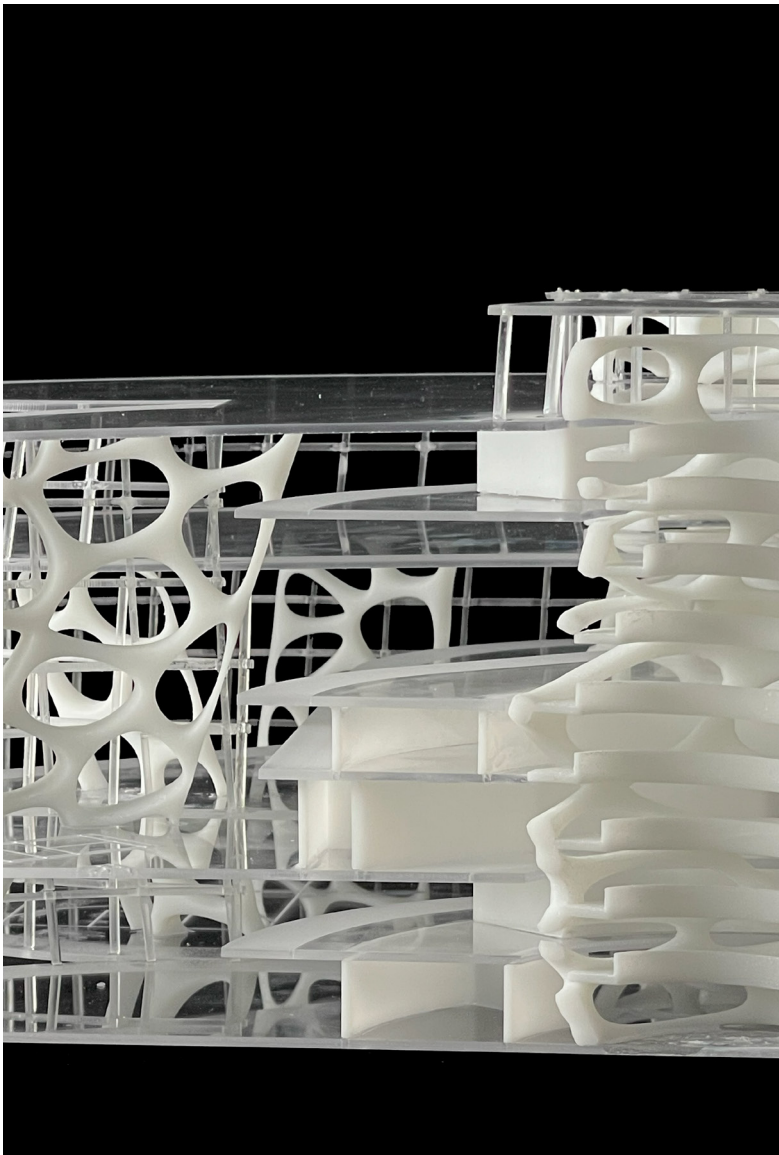
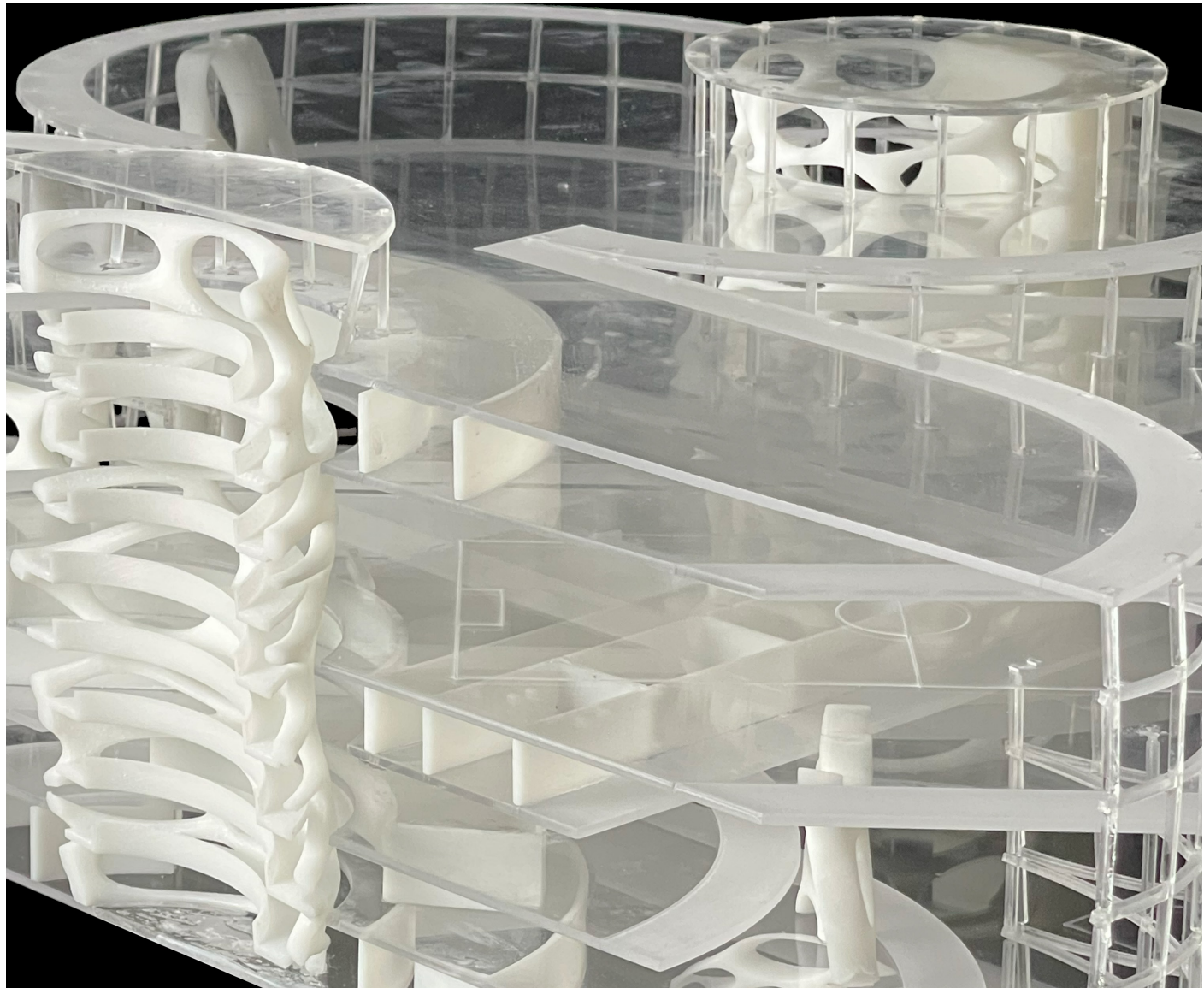


Indoor rehabilitation space rendering

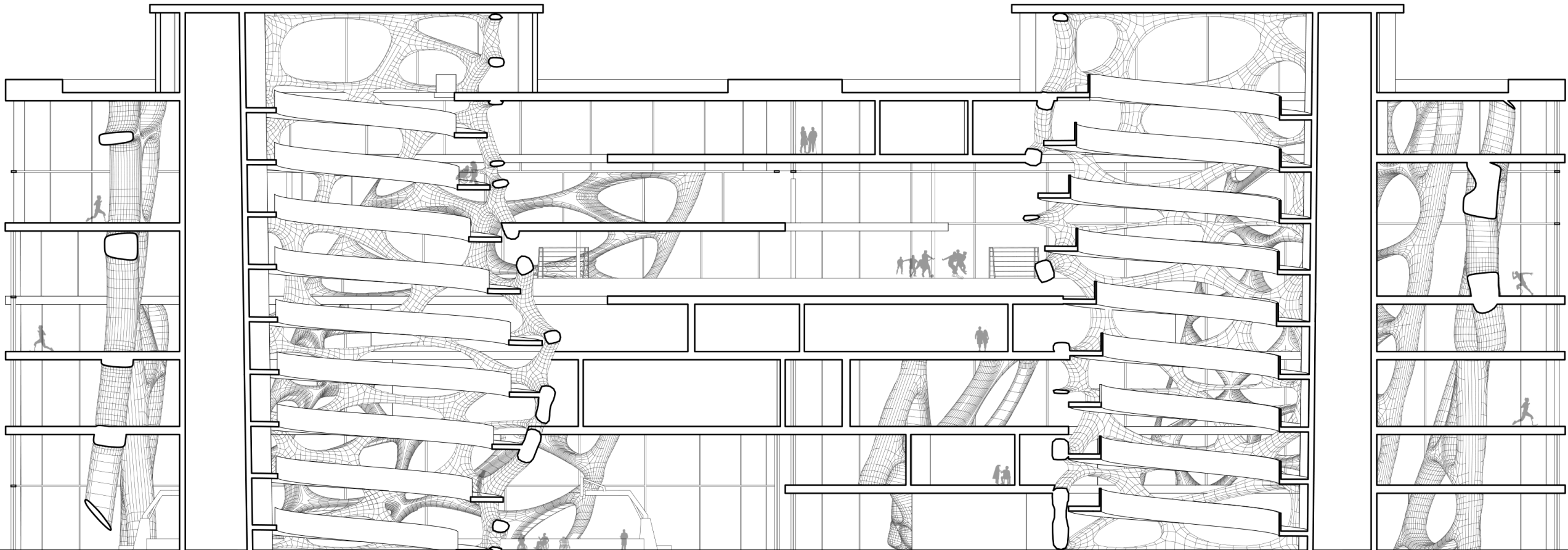


Sectional Perspective





Project Hand-Model details



Sectional Plan





# Creative Haven

TikTokHub:  
Your Shared Studio Space

## Project Key Words:

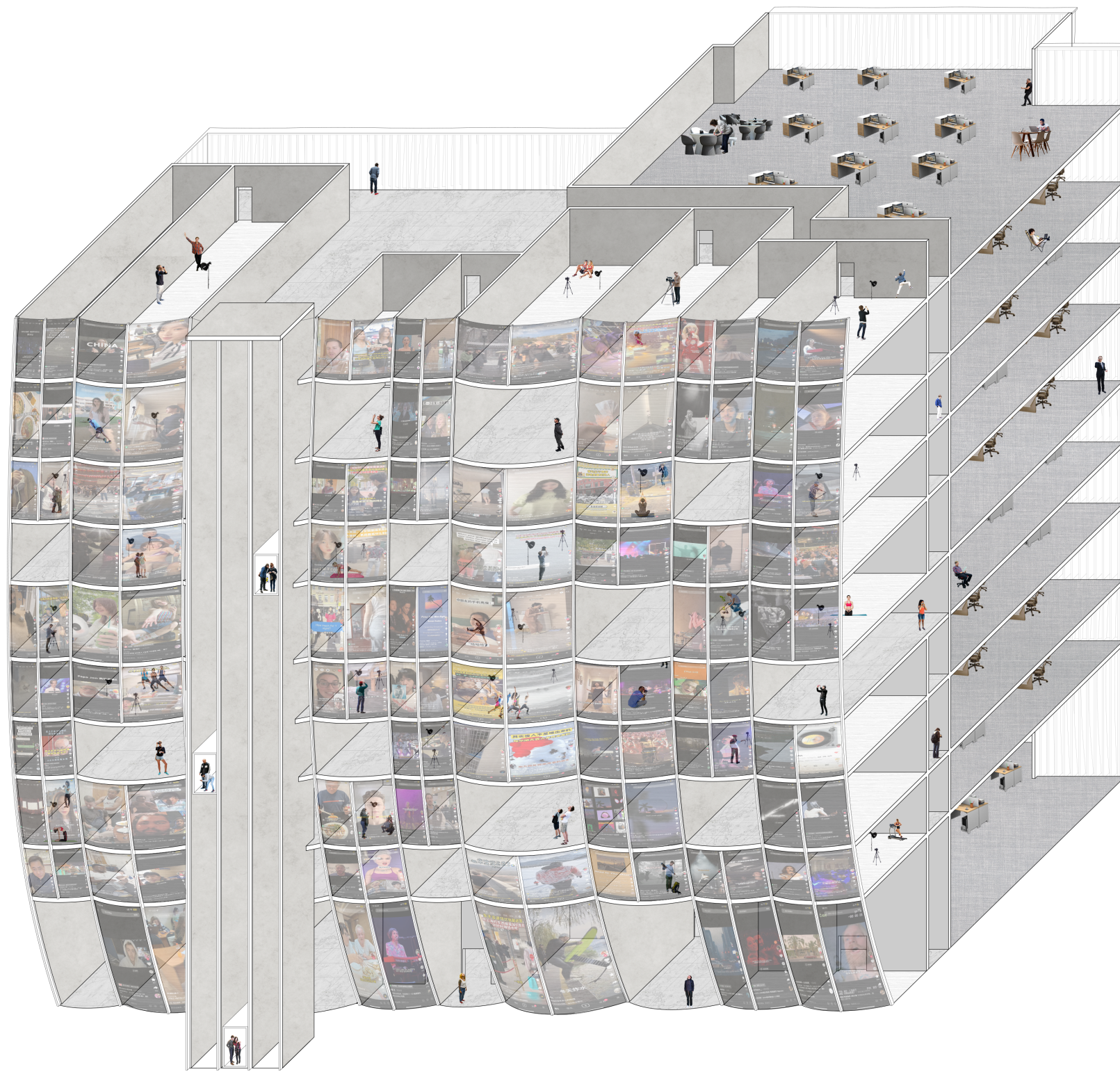
Immersive Atrium, Seamless Glass Facade, Content Creation Hub, Knowledge Sharing Architecture, Digital Media Incubator.

## Project Description:

This building's focal point is its atrium, encircled by studios and enveloped in seamless glass panels. From the center, visitors experience a sensation akin to navigating TikTok endlessly scrolling downward, while standing in the studios offers a similar perception, as if being a bubble within the cascade.

This building is designed to break down knowledge barriers. With TikTok's global reach, accessing a multitude of videos is just a tap away. However, many face constraints like lack of editing skills, filming know-how, or time for content creation and analysis. Stepping into this space, individuals find everything they need: public studios, professional editing teams, and expert media instructors. Here, they can create content without hindrances, sharing their knowledge effortlessly and dismantling existing barriers in various industries.





Building functional area analysis drawing



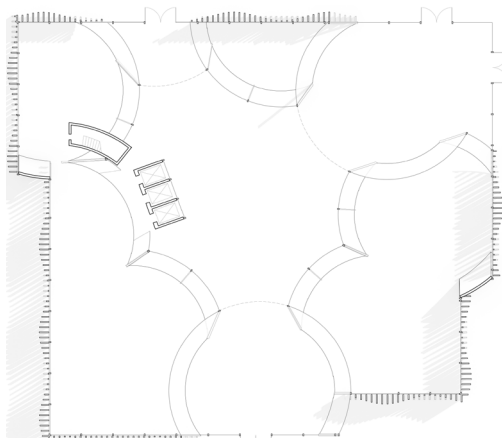
Project Hand-Model corner details



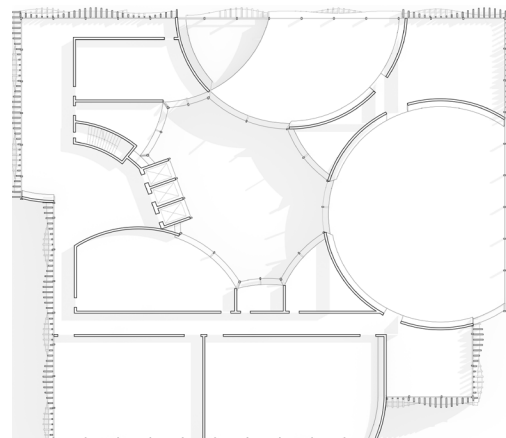
Project Hand-Model facade details



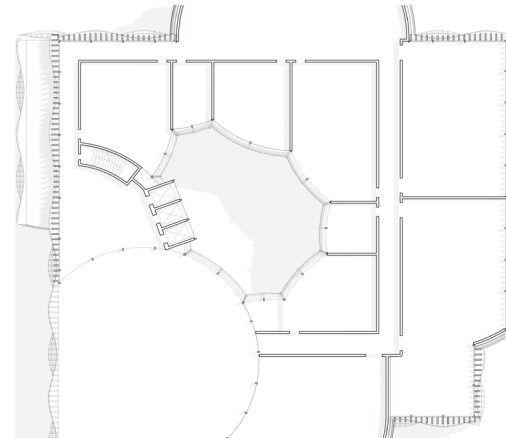
Building facad & window rendering



Ground Floor Plan



2nd Floor Plan

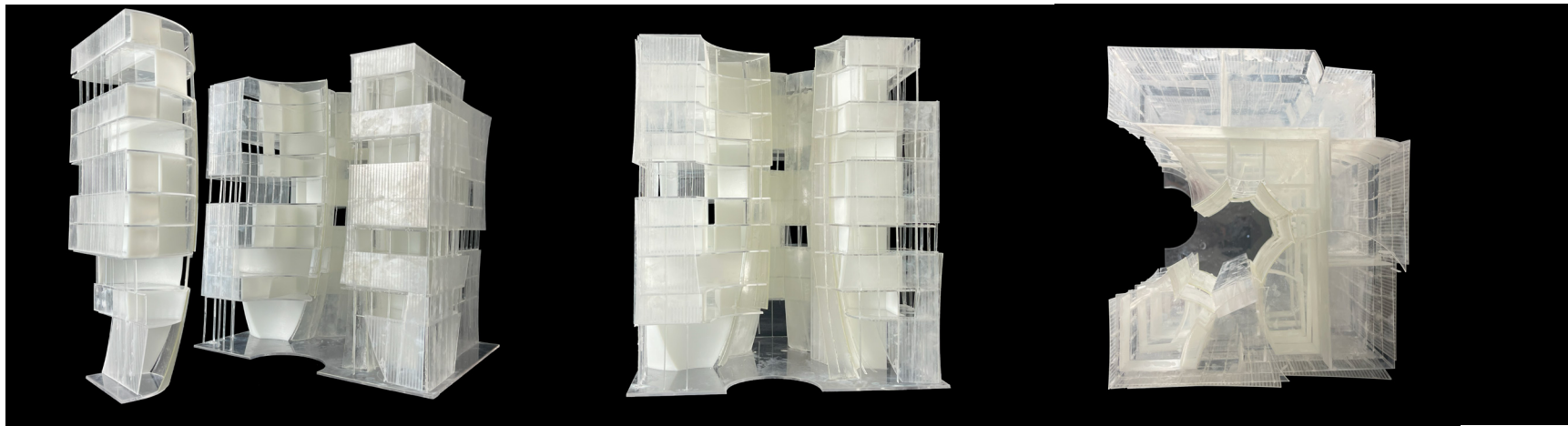


9th Floor Plan



Looking down at the Atrium rendering





Project Hand-Model



Sectional Perspective



Looking up at the Atrium rendering



Photography room view at the Atrium rendering



Open space on the 2nd floor rendering



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